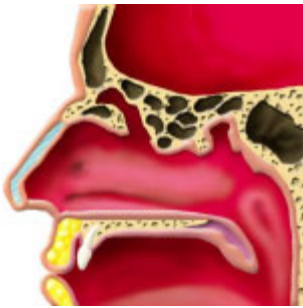




## *X-Plain™* *Sinus Surgery*

### Reference Summary

Sinus surgery is a very common and safe operation. Your doctor may recommend that you have sinus surgery. The decision whether or not to have sinus surgery is also yours. This reference summary will help you understand the benefits and risks of this procedure.



#### **Anatomy**

Sinuses are empty pockets filled with air in the head. There are four pairs of sinuses in the skull. Sinuses circulate air and lubricate the nose, keeping it free of bacteria and dust. The sinuses are lined by special cells called mucosa that secrete 'mucus' which helps trap dirt from the air we breathe. The dirt is then expelled to the outside using small hair-like attachments known as cilia. All sinuses are connected to

the nasal cavity through small tube-like openings. The opening where the sinuses join together in the nasal cavity is called the 'middle meatus.' Healthy sinuses are not plugged and the mucosa is not inflamed. The mucus they secrete is watery and is able to pass through the middle meatus into the nose without any problem. The mucus then passes from the nose to the throat where it is swallowed.

#### **Symptoms And Their Causes**

Infections, allergies, or obstruction of the openings of the sinuses can cause inflammation of the mucosa and can block the drainage system of the sinus cavities. Sinusitis occurs when the lining of the sinuses becomes inflamed. When the sinuses are inflamed, the mucus becomes thicker and is unable to pass through the openings, therefore, accumulating in the sinuses. Symptoms of inflamed sinuses may include:

- Facial Pain
- Headache
- Fever
- Voice change

- Tender cheeks

The obstruction of the sinuses could also be due to a swollen or overgrown mucosa, known as a 'polyp.' Polyps can result from repeated infections and inflammation of the mucosa.

The bony structure separating the two halves of the nose is called the septum. The septum may become deviated, or not straight. Patients may either be born with a deviated septum, or the deviation may happen after an injury. If the septum is deviated it can block the sinus opening.

Turbinates are bones that hang from the walls of the nose. If the mucosa that lines the turbinates swells, the sinus openings could become blocked.



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## Diagnosis

The doctor determines if the patient has sinusitis after a thorough examination of the ear, nose, and throat. The physician will try to determine if the sinusitis is caused by allergies, infections, or by an obstruction. X-rays and CAT scan images may be taken to see the sinuses inside the head. Blood and allergy tests may also be done to try to determine the cause of the sinusitis.

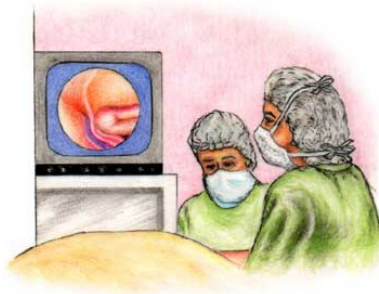
## Medical Treatment

Most cases of sinusitis are successfully treated medically. Using humidifiers and placing either cold or warm compresses over the sinuses can help relieve some of the symptoms. Drinking a lot of fluid makes the mucus more watery. The more watery the mucus is, the less likely it is to get trapped in the sinuses. Depending on the cause of sinusitis, medications may be given.

Patients who have sinusitis due to allergies can be asked to stay away from things that cause the allergies. They also may be given anti-allergy medications.

For sinusitis caused by infections or bacteria growing in the sinuses, antibiotics are given to kill the germs and control the infection. Sinusitis caused by infection

may be initially caused by allergies. The initial sinusitis causes mucus to pool in the sinuses. Germs can then grow in this mucus, resulting in a sinusitis that is caused by both allergies and infections. In sinusitis caused by infection, the mucus may turn yellowish to greenish and may have a foul-smelling odor. Repeated sinusitis may be caused by an obstruction to the flow of mucus. This type of sinusitis is the most responsive to surgery.



## Sinus Surgery

Sinus surgery is very safe. The aim of the surgery is to open any sinus obstruction. This may require the removal of polyps that are blocking the openings of the sinuses. It may also require enlarging the hole that the sinuses drain through.

Sometimes the walls between the sinuses are removed to make the sinuses bigger, creating less possibility of obstruction. Other times, new openings are created in the sinuses to make it easier for the mucus to drain. These

openings are made between the maxillary sinus and the inside of the nose. These openings do not show on the outside.

If the septum is deviated and obstructing the sinuses, surgery may be necessary to straighten it out. Most of these surgeries are done using a scope. This is called endoscopic sinus surgery. The endoscope is a hollow thin tube that allows the doctor to see inside the sinuses. The surgeon inserts the endoscope through a tiny incision. The endoscope allows the doctor to see the sinuses on a video screen. The surgeon then inserts other small instruments through one or more other small incisions to operate while looking on the video screen. Sometimes during an endoscopic surgery, the surgeon may determine that open incisions are needed to enter the maxillary sinuses. These incisions are made either in the nose or mouth, behind the upper lip and above the gum.

Sinus surgery is usually done under general anesthesia. Patients usually go home the same day of the surgery. Your doctor will explain to you the procedure recommended for you and the type of anesthetics that will be used.

## Risks And Complications

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Sinus surgery is very safe. There are, however, several possible risks and complications, which are unlikely but possible. You need to know about them just in case they happen. By being informed you may be able to help your doctor detect complications early.

The risks and complications include those related to anesthesia and those related to any type of surgery.

Risks related to anesthesia include, but are not limited to, heart attacks, strokes, pneumonia, and blood clots in the legs. If the blood clot gets dislodged, it may cause respiratory failure. Any of these complications could lead to death. Complications of anesthesia are more likely in patients with previous medical problems, such as heart attacks or lung problems. These risks will be discussed with you in greater detail by your anesthesiologist.

Some of the risks are seen in any type of surgery, but these are rare. These include infection, which may have to be treated with antibiotics. Bleeding, which may require a blood transfusion. This is, however, extremely rare.

Other risks and complications are related specifically to this surgery. These, again, are very rare; however, it is

important to know about them.

During sinus surgery, it is possible to create an opening between the sinuses and the brain. The fluid around the brain, or cerebro-spinal fluid, can then leak from the nose. The leaking fluid can cause infections around the brain, known as meningitis. The leak usually stops spontaneously with bed rest. If it does not, it may necessitate brain surgery to plug the leaking hole. This complication is extremely rare.

In extremely rare cases, bleeding can occur in the brain, leading to strokes and possibly death. The operation can also lead to numbness of the upper teeth because the nerves responsible for the sensations of the upper teeth run in the floor of the maxillary sinuses. It is also possible for the blockage to happen again, making another surgery necessary.

### **After The Surgery**

After recovering from the anesthetics in the recovery area, you will be discharged with specific instructions. Be sure to have someone drive you home. At home, you should rest after the surgery to prevent bleeding. Your doctor will tell you when you can go back to work. A

bandage is placed under the nose. It is normal to have some bleeding and drainage after the surgery. You should let your doctor know if the bleeding becomes severe.

You should also let your doctor know if the drainage becomes very clear, like tap water. This may be the first indication that there is a fluid leak from around the brain into the nose. You should also let your doctor know if the drainage becomes thick, greenish or foul smelling. This may be an indication of an on-going infection. Your doctor may prescribe salt-water rinses to keep the inside of your nose and sinuses moist. The use of humidifier is encouraged as it helps keep the nose moist and the mucus thin.

### **Summary**

Sinus surgery is very safe and common. It is very well tolerated by patients and can help to successfully treat several sinus diseases. Some rare risks and complications are possible during or after sinus surgery. Knowing about them will help you and your doctor detect them early and treat them if they happen.